

WHAT IS CLAIMED IS:

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1. An image pickup apparatus comprising:
a plurality of pixels; and
a color filter array of four colors disposed on
5 said plurality of pixels,
wherein said color filter array has a periodicity
of two rows \times two columns, and colors of four color
filters in a periodical unit of two rows \times two columns
are all different from each other.
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2. An image pickup apparatus according to claim
1, wherein the four color filters include a filter of
transmitting only green light in a visible light range,
a filter of intercepting only blue color in the visible
15 light range, a filter of intercepting only green light
in the visible light range, and a filter of
intercepting only red light in the visible light range.
3. An image pickup apparatus according to claim
20 1, further comprising means for performing an operation
of $A + B - C - D$, where A, B, C, and D represent
signals picked up from an area of two rows \times two
columns.
- 25 4. An image pickup apparatus according to claim
3, wherein the signals A and B are disposed on a same
line or on a same column, and the signals C and D are

disposed on a same line or on a same column.

5 5. An image pickup apparatus according to claim
3, further comprising means for performing an operation
of $A + C - B - D$.

10 6. An image pickup apparatus according to claim
5, wherein the signals A and B are disposed on a same
line or on a same column, and the signals C and D are
disposed on a same line or on a same column.

15 7. An image pickup apparatus according to claim
1, further comprising means for reading a difference
between an addition signal of a first row, first column
signal and a first row, second column signal and an
addition signal of a second row, first column signal
and a second row, second column signal, respectively in
an area of two rows \times two columns column, and means for
reading a difference between an addition signal of a
20 first row, first column signal and a second row, first
column signal and an addition signal of a first row,
second column signal and a second row, second column
signal, respectively in the area of two rows \times two
columns column.

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8. An image pickup apparatus according to claim
7, wherein the areas of two rows \times two columns are

disposed without any space therebetween.

9. An image pickup apparatus according to claim
1, further comprising means for reading an addition
5 signal of all signals in an area of four rows \times one
column.

10. An image pickup apparatus according to claim
1, further comprising means for reading an addition
10 signal of all signals in an area of one row \times four
columns.

11. An image pickup apparatus comprising:
a plurality of pixels;
15 a color filter array of four colors disposed on
said plurality of pixels and having a periodicity of
two rows \times two columns; and
calculating means for calculating two color
difference signals from each color filter of two rows \times
20 two columns in said color filter array having the
periodicity of two rows \times two columns.

12. An image pickup apparatus according to claim
11, wherein said calculating means performs an
25 operation of $A + B - C - D$, where A, B, C, and D
represent signals picked up from an area of two rows \times
two columns.

13. An image pickup apparatus according to claim 12, wherein the signals A and B are disposed on a same line or on a same column and the signals C and D are disposed on a same line or on a same column.

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14. An image signal read method of reading an image signal from the image pickup apparatus recited in claim 1, wherein an image signal is read by performing an operation of $A + B - C - D$, where A, B, C, and D represent signals picked up from an area of two rows x two columns.

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15. An image signal read method according to claim 14, wherein the signals A and B are disposed on a same line or on a same column, and the signals C and D are disposed on a same line or on a same column.

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16. An image signal read method according to claim 14, wherein an image signal is read by performing an operation of $A + C - B - D$.

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17. An image signal read method according to claim 16, wherein the signals A and B are disposed on a same line or on a same column, and the signals C and D are disposed on a same line or on a same column.

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18. An image signal read method of reading an

image signal from the image pickup apparatus recited in claim 1, wherein a difference between an addition signal of a first row, first column signal and a first row, second column signal and an addition signal of a second row, first column signal and a second row, second column signal, respectively in an area of two rows x two columns column, is read as a first color difference signal, and a difference between an addition signal of a first row, first column signal and a second row, first column signal and an addition signal of a first row, second column signal and a second row, second column signal, respectively in the area of two rows x two columns column, is read as a second color difference signal.

19. An image signal read method according to claim 15, wherein the areas of two rows x two columns are disposed without any space therebetween.

20. An image signal read method of reading an image signal from the image pickup apparatus recited in claim 1, wherein an addition signal of all signals in an area of four rows x two columns is read as a luminance signal.

21. An image signal read method of reading an image signal from the image pickup apparatus recited in

claim 1, wherein an addition signal of all signals in an area of two rows \times four columns is read as a luminance signal.

5 22. An image pickup apparatus comprising:
a plurality of pixels;
a color filter array of four colors disposed on
said plurality of pixels;

10 first calculating means for calculating a
difference between an average signal of a first row,
first column signal and a first row, second column
signal in an area of two rows \times two columns and an
average signal of a second row, first column signal and
a second row, second column signal in the area of two
15 rows \times two columns; and

 second calculating means for calculating a
difference between an average signal of a first row,
first column signal and a second row, first column
signal in the area of two rows \times two columns and an
20 average signal of a first row, second column signal and
a second row, second column signal in the area of two
rows \times two columns.

25 23. An image pickup apparatus according to claim
22, wherein:

 said first calculating means comprises first
storing means for storing the first row, first column

signal, second storing means for storing the first row,
second column signal, third storing means for storing
the second row, first column signal, fourth storing
means for storing the second row, second column signal,
5 first averaging means for averaging the signals stored
in said first and second storage means, second
averaging means for averaging the signals stored in
said third and fourth storage means, and first
difference calculating means for calculating a
10 difference between an averaged signal of the signals
stored in said first and second storage means and an
averaged signal of the signals stored in said third and
fourth storage means; and
said second calculating means comprises fifth
15 storing means for storing the first row, first column
signal, sixth storing means for storing the second row,
first column signal, seventh storing means for storing
the first row, second column signal, eighth storing
means for storing the second row, second column signal,
20 third averaging means for averaging the signals stored
in said third and fourth storage means, fourth
averaging means for averaging the signals stored in
said fifth and sixth storage means, and second
difference calculating means for calculating a
25 difference between an averaged signal of the signals
stored in said fifth and sixth storage means and an
averaged signal of the signals stored in said seventh

and eighth storage means.

24. An image signal processing apparatus for the
image pickup apparatus recited in claim 1, comprising
5 means for performing an operation of $A + B - C - D$,
where A, B, C, and D represent signals picked up from
an area of two rows \times two columns.

25. An image signal processing apparatus
10 according to claim 24, wherein the signals A and B are
disposed on a same line or on a same column, and the
signals C and D are disposed on a same line or on a
same column.

26. An image signal processing apparatus
15 according to claim 24, further comprising means for
performing an operation of $A + C - B - D$.

27. An image signal processing apparatus
20 according to claim 26, wherein the signals A and B are
disposed on a same line or on a same column, and the
signals C and D are disposed on a same line or on a
same column.

28. An image signal processing method for the
25 image pickup apparatus recited in claim 1, comprising a
step of performing an operation of $A + B - C - D$, where

A, B, C, and D represent signals picked up from an area of two rows \times two columns.

5 29. An image signal processing method according to claim 28, wherein the signals A and B are disposed on a same line or on a same column, and the signals C and D are disposed on a same line or on a same column.

10 30. An image signal processing method according to claim 28, comprising a step of performing an operation of $A + C - B - D$.

15 31. An image signal processing method according to claim 30, wherein the signals A and B are disposed on a same line or on a same column, and the signals C and D are disposed on a same line or on a same column.

20 32. A computer readable storage medium storing a program for the image pickup apparatus recited in claim 1, wherein the program performs an operation of $A + B - C - D$, where A, B, C, and D represent signals picked up from an area of two rows \times two columns.

25 33. A computer readable storage medium according to claim 32, wherein the signals A and B are disposed on a same line or on a same column, and the signals C and D are disposed on a same line or on a same column.

34. A computer readable storage medium according to claim 32, wherein the program further includes a program of performing an operation of $A + C - B - D$.

5 35. A computer readable storage medium according to claim 34, wherein the signals A and B are disposed on a same line or on a same column, and the signals C and D are disposed on a same line or on a same column.

10 36. An image pickup system comprising the image pickup apparatus recited in claim 1 and the image signal processing apparatus recited in claim 24.

15 37. An image pickup system comprising the image pickup apparatus recited in claim 1 and the image signal processing apparatus recited in claim 26.

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